

### Digital Video Noise Reducer

The 5475 Digital Video Noise Reducer is an optional sub module that can be added to the 5470 Digital Proc Amp module. The 5475 is motion and scene adaptive. It removes unwanted noise and artifacts, making it perfect for MPEG compression preprocessing and satellite feeds.

Several forms of noise reduction are employed to ensure the best possible performance. Horizontal Filtering is used to remove high frequency and impulse noise and to limit bandwidth for MPEG encoding. Recursive Temporal Noise filtering includes Simple Recursive, Motion Adaptive and Motion Adaptive with Impulse filter. Controls are provided for maximum signal-to-noise improvement and for noise threshold. These can be set manually or run in automatic mode.

Motion Adaptive Recursive Noise filtering works on a pixel-by-pixel basis, comparing the current frame to frames that have already been filtered. If the change that is detected is small, it is considered noise, while if it is large, it is considered motion or a scene change. The detection process uses an LMMSE (Linear Minimum Mean Square Error) filtering algorithm to evaluate the presence of motion. Combining this algorithm with recursive temporal filters preserves fine detail while reducing noise in the presence of motion, including rapidly moving objects and scene changes. Motion trails are minimized while avoiding hard-motion failures that some adaptive noise filters can exhibit.

User controls for the Motion Adaptive Recursive Filter include a Noise Threshold, based on how much noise is present in the incoming signal, and Maximum Signal to Noise Improvement, based on how much noise removal is desired. The threshold setting can be automatic or user-adjustable. When set to automatic, the noise level of the input signal is measured and the threshold is set accordingly. This simplifies the setup of the noise reducer and makes it responsive to varying input signal-to-noise levels. This minimizes the need for operator intervention to accommodate feeds of differing quality.

When the combined Motion Adaptive Recursive and Impulse Noise Filter is selected, temporal impulse noise filtering is used to remove high level, narrow noise impulses, without reducing fine stationary detail. Since the 5475 is used in conjunction with the 5470 Proc Amp, all the controls you need for level adjustments and clipping are included.

The Show Noise output mode displays what areas of the picture are being affected by the noise reducer. Noise is represented by white or black, while unaffected areas are represented in gray. This handy mode makes it easy to set optimum adjustments for the material being processed. The Split Screen mode lets you compare the processed output to the original signal.

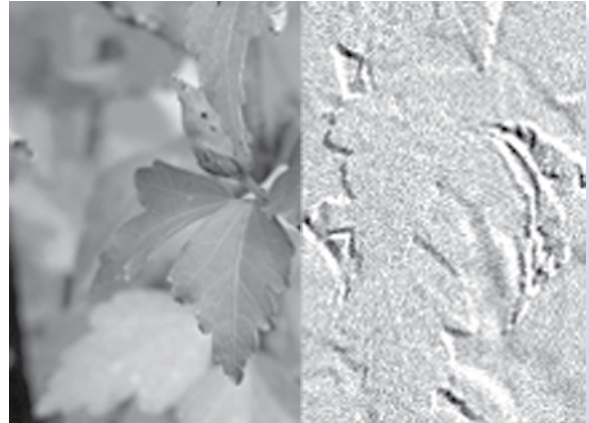
#### Features

- » Motion Adaptive Recursive and Horizontal filtering
- » Frame based recursion
- » Temporal Impulse Filtering
- » Motion and Scene Adaptive
- » Spatial and temporal modes
- » Preprocessing for MPEG
- » 12 bit processing
- » Minimal processing delay
- » Automatic Noise Level sensing
- » Automatic or Manual Reduction and Threshold setting
- » Luma and Chroma Processing with separate controls
- » Split Screen and Show Noise mode
- » Luma Tie reduces cross-color artifacts
- » Used in conjunction with 5470 Proc Amp – includes proc adjustments and detail enhancer
- » Remote control and alarms
- » Use with 525 or 625 signals

In addition to the 5475 motion-adaptive temporal filters, horizontal bandwidth filtering and luma chroma delay filters are provided. Sixteen tap 3/4, 1/2 and 1/4 luma bandwidth filters can be selected. Also sixteen tap 3/4 and 1/2 chroma bandwidth filters can be selected. These filters can be used to limit bandwidth before MPEG encoding. Simultaneously, the luma path delay can be adjusted relative to chroma path delay in approximately 2 nsec subpixel steps, providing the ability to correct luma-chroma delay errors in serial digital signals.

Since the 5475 is used in conjunction with the 5470 Proc Amp, all the controls you need for level adjustments and clipping are included.

The Show Noise feature displays the detected noise and residual motion which will be removed from the video.



Split Screen displays the noise-reduced output next to the original scene.



Complete control over all DNR functions.

